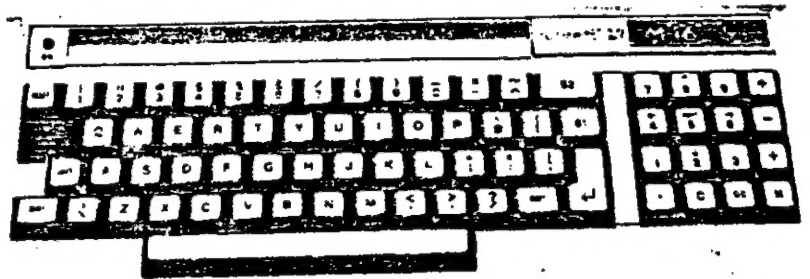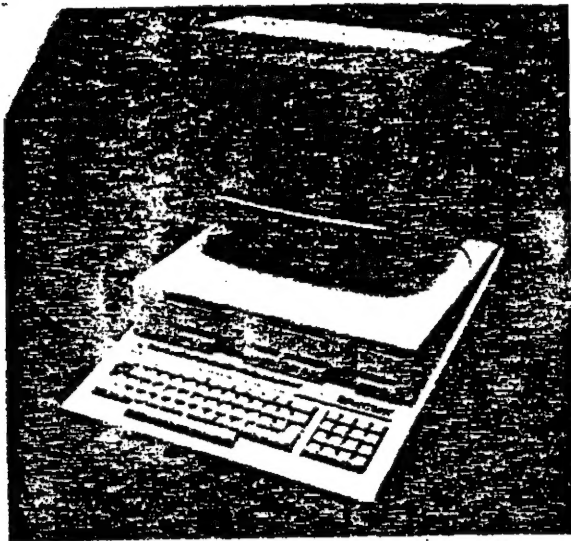# olivetti

M20,
M16

PERSONAL COMPUTER

BASIC UNIT

The basic unit consists of:
- Central unit
  - CPU Z8001 - 16 bit bus
  - Read Only Memory (ROM)
  - Random Access Memory (RAM)
  - Display, keyboard and mini floppy disk controllers
  - RS 232 C - V24 serial interface
  - Parallel printer interface
  - 5-slot expansion bus
  - Alphanumeric buffered keyboard
- Minifloppy disk unit (MFD 1033)
- 12" alphanumeric and graphic display (DSY 1036)

OPTIONS

- Second minifloppy disk unit (MFD 1034)
- 32 Kbyte Memory extension module (MEM 1035)
- Parallel interface controller for connection to IEEE 488 compatible peripherals (PIC 1037)

Central Unit
CPU

Z8001 microprocessor with 16 bit technology and LSI and MSI circuits.

Frequency:	4 MHZ
Cycle time:	250 ns.
Memory access time:	*150 ns*

Random Access Memory (RAM)
MOS integrated circuit design

CPU 1042

Based on 64 K bit memory chips 128 Kbyte capacity expandable to 224 Kbyte by adding up to three optional MEM 1035 boards.

Serial Interface

For connection via modem to data transmission lines using BSC 1 and BSC 2 protocols, and to EIA RS 232 C (CCITT V24) compatible peripheral units. Transmission speed is program selectable from 50 to 9600 baud.

Parallel Printer Interface

For connection of all Olivetti printers compatible with M16

Alphanumeric Keyboard

High quality electronic keyboard with 72 keys for programs, comands and data input, divided in two sections:
- Multifunctional alphanumeric section
  - upper and lower case
  - full-screen editing functions
  - user-programmable function keys with template
    These functions are selected by use of shift keys, generating a total fo 256 commands/functions
  - 3 program-testable entry-closure keys
  - general reset key
- Numeric section
  - digits 0 to 9 and double zero (00)
  - arithmetic operators
  - decimal point
  - cursor control keys
    All keys have automatic repeat feature.
    National lay-outs available.
    Basic keyboards optionally available on USA-ASCII version.

Average reliability for each key: 10 millions strokes.
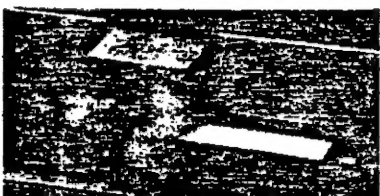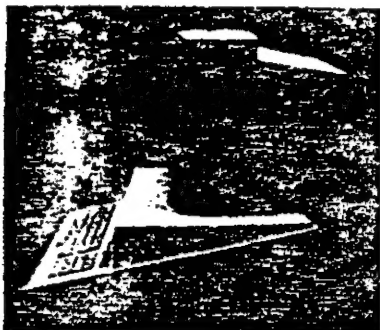
Minifloppy Disk Unit

For storage of operating system, programs and data on minifloppy disks. Uses double-density/double-sided 5 1/4" minifloppy disks, according to the ECMA standard.

Unformatted capacity: 320 Kbyte
Average access time: 303 ms.
Transfer rate: 250 K bit/sec.

Display

Alphanumeric and graphic display for displaying images, graphs, data programs and system messages, using bit-map technology.
- Alphanumeric characteristics:
  • 96 standard ISO characters (upper an lower case, special characters, etc.)
  • user definable characters
  • software definable format. Either
- 1024 characters (64 char. per line/16 lines) or
- 2000 characters (80 char. per line/25 lines)
  • visual characters attributes (reverse and hide)
- Graphic characteristics:
  • dimension of the image: 225 × 140 mm.
  • dimension of the grid: 512 × 256 pixels
    Refresh frequency 65 Hz
    Brightness control
    White or green phosphor.

Colour Display

The system allows the connection of a colour display with an 8-colour palette and identical characteristics of the monochrome version.

Printers

For printing documents, diagrams, for hardcopy of display, both alphanumeric and graphic, the M16 can be connected to the following desk-top printers via the parallel printer interface:

PR 2400

Thermal dot-matrix printer with optional graphic capabilities.
- Alphanumeric characteristics:
  • 240 l.p.m.
  • 80 characters (1/10") per line
- Graphic characteristics:
  • 1800 l.p.m. (elementary line of dots)
  • 560 dots per line

PR 1450

Impact dot-matrix printer
  • 100 char/sec. monodirectional
  • 80 (1/10"), 132 (1/16,6") characters per line
  • friction and fixed pin feed
  • optional sprocket feed and manual front feed
  • 1 + 2 copies

PR 1471

Impact dot-matrix printer
  • 140 char/sec. bidirectional optimised path
  • 132 (1/10"), 158 (1/12") and 220 (1/16,6") characters per line
  • sprocket feed
  • 1 + 4 copies

PR 1480

Impact dot-matrix printer with sophisticated paper handling features.
  • 140 char/sec. bidirectional optimised path
  • 132 (1/10"), 158 (1/12") and 220 (1/16,6") characters per line
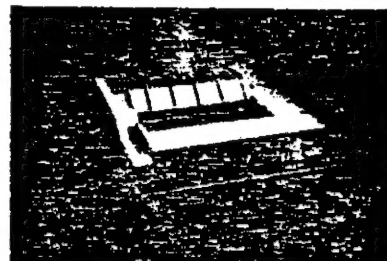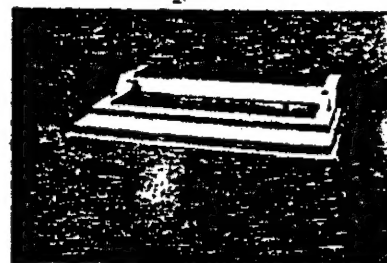 • 1 + 4 copies
- options:
  • manual front feed
  • automatic front feed with marker
  • sprocket feed
  • graphic capabilities
  • four colours

PR 420

Daisy-wheel printer for quality printed documents and multiple character fonts.
  • 20 char/sec.
  • 132 (1/10"), 158 (1/12"), 198 (1/15") and 114-198 (proportional spacing) characters per line
  • 1 + 4 copies

PROGRAMMING LANGUAGE

The M16 uses and interpreted version of Microsoft BASIC-80, extended to include graphics and IEEE 488 interface handling.
Principal graphics features include:
- multiple windowing
- points, lines, boxes, arcs, circles and elipses
- polygon fill
- absolute and relative positioning
- scale (user coordinates)
- saving/loading of images to/ from disk
- hard-copy

IEEE 488 features:

SH (Source Handshake), AH (Accept Handshake), T (Talker), L (Listener) and C (Controller) functions of the IEEE 488 standard are supported.

OPERATING SYSTEM

PCOS (Personal Computer Operating System) is a modular Operating System resident on minifloppy disk.
The most frequently used modules may be held in reserved system memory.
Its principal characteristics are:
- management of system resources
- command control language
- immediate or deferred execution of commands
- user HELP support for syntax of commands, list of commands, explanation of error codes.
- execution of utility programs (formatting, copying, volume and volume or file password protection
- file system with sequential, random and ISAM data access
- Assembler subroutine calls
- line and full-screen editors
- user-programmable function keys
- automatic start-up procedure

ACCESSORIES

Minifloppy Disk: unformatted capacity of 320 K byte, 35 tracks per side sub-divided into 16 sectors of 256 bytes each.
Stores opeating system, data and programs.

STANDS

A wide range of stands is available for the M16.

ELECTRICAL SPECIFICATIONS

Voltage: 220 V
Frequency: 50 Hz
Consumption: approx. 140 W
The power supply may be adapted to other voltages and frequencies.

DIMENSIONS

Basic Unit: width 430 mm.
             depth 519 mm.
             height 155 mm.
             weight   11 kg.
Display: width 334 mm.
             depth 310 mm.
             height 260 mm.
             weight 9 Kg.

ENVIRONMENTAL CONDITIONS

Temperature: 10° - 40° C
             (50° F - 104° F)
Relative humidity: 10% - 95%
No air conditioning required.

10th August 1984

Philip

PC 1000

VERY SMALL BUSINESS SYSTEM / PERSONAL SCIENTIFIC COMPUTER

olivetti
Advanced Technology Center

PC 1000 – MARKETS

The PC 1000 is a stand alone system addressed to the PERSONAL COMPUTERS FOR PROFESSIONAL APPLICATIONS market sector (as defined by Dataquest).

This market sector can be subdivided into the following classes, all of which will be covered by PC 1000 configurations:

. Systems for Business applications   (VSBS)

. Systems for scientific applications
  (computer assisted problem solving)

. Systems for education

Moreover with the planned optional expansions the PC1000 can be used as a:

. Videotex system

. Low end data entry system

PC 1000 – MODELS

Two PC1000 models are presently planned :

- PC 1000 Minifloppy Disk

- PC 1000 Hard Disk

The Hard Disk model is identical to the Minifloppy Disk one with the exception of bigger RAM memory and a 9 MB Winchester disk drive.

Both models are configured into a basic system and optional modules.

PC 1000 – SYSTEM CONFIGURATION

PRINTERS

PARALLEL INTERFACE

VIDEOTEX INTERFACE

IEEE INTERFACE

RS 232C INTERFACE

BIT MAP COLOR DISPLAY

BIT MAP DISPLAY

640 KB (o)

5 Inch
320 KB

5 Inch
320 KB

OR

5 Inch
8.8 MB

ROM MEMORY
64 KB – 8 KB (o)

KEYBOARD

CPU Z8001

RAM MEMORY
32 KB – 128 KB (o)

MEMORY EXP.
32 KB

MEMORY EXP.
32 KB

MEMORY EXP.
32 KB

■ ■ ■ ■ OPTIONAL MODULES

3
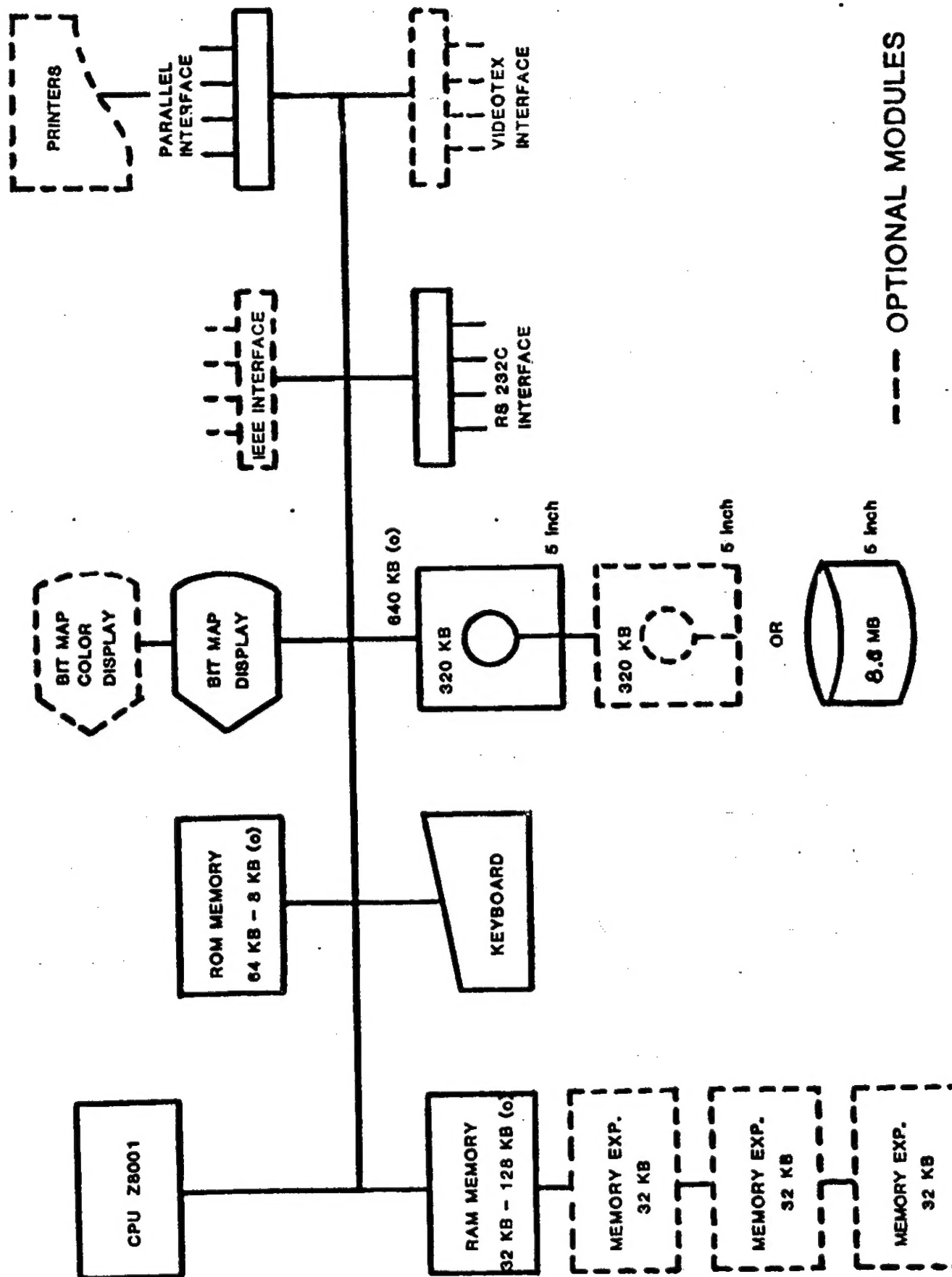
PC1000 HARDWARE DESCRIPTION - STANDARD MODULES

ELECTRONIC BOARD

- CPU Z8001

- 64 KB (8 KB for the HDU model) ·ROM
  used for OS, BASIC interpreter, diagnostic

- 32 KB (128 KB for the HDU model) RAM
  of which 10 – 42 KB available for user programs

- keyboard, CRT, minifloppy disk controllers

- RS 232C serial interface with programmable speed
  up to 9600 bps

- parallel interface (Centronics like)

- power supply

PC 1000 HARDWARE DESCRIPTION -STANDARD MODULES

KEYBOARD

- 72 keys subdivided into alphanumeric, numeric and function keys

- user programmable function keys

DISPLAY

- 12 in. monochromatic CRT (white phosphor)

- graphic capabilities with bit – map technology

- 1024 char. capacity in text mode (64 x 16)

- 512 x 256 dots capacity in graphic mode

- visual attributes : reverse, ▬▬▬ hide

PC 1000 HARDWARE DESCRIPTION - STANDARD MODULES

MINIFLOPPY DISK

- 5.25 in. magnetic media
- 320 KB capacity per mini floppy (unformatted)
- 303 msec average access time
- media compatible with other Olivetti systems   *(up.)*

HARD DISK UNIT   (HDU model only)

- 5.25 in. platter
- 8.8 MB capacity (formatted)
- 66 msec average access time

PC 1000 HARDWARE DESCRIPTION – OPTIONAL MODULES

COLOR DISPLAY

- 12 in. CRT

- software compatible with B/W version

- same capacity as B/W version (1024 char. – 512 x 256 dots)

- max 4 colors displayed simultaneously
  (chosen from a 8 colors palette)

- requires one memory exp. board , colour video version

MEMORY EXPANSION BOARD

- max 3 boards per system

- 32 KB per board

PC 1000 HARDWARE DESCRIPTION – OPTIONAL MODULES

2nd MINIFLOPPY DISK DRIVE

- same characteristics as first drive

IEEE – 488   INTERFACE

VIDEOTEX BOARD

- compatible with Prestel system

- with integrated, dual channel modem

PC 1000 HARDWARE DESCRIPTION – OPTIONAL MODULES

PRINTERS

- thermal printer with graphic capabilities PR 2400 (240 lpm) _Jan '82_

- dot matrix impact printer XU 7305 (80 col., 100 cps) _Jan '82_

- dot matrix impact printer XU 7310 (132 col., 140 cps) _Jan '82_

- daisy wheel printer XU 7740 (20 cps) _May '82_

PC 1000 SOFTWARE DESCRIPTION

OPERATING SYSTEM (PHICOS)

. mono user / mono task

. ROM based on MFD model

BASIC INTERPRETER

. compatible with Microsoft Basic-80 rel. 5.2 plus

graphic and IEEE - 488 extensions

. ROM based on MFD model

GENERAL PURPOSE PACKAGES

. ISAM package   *Index Sequential*.

. communication package for batch-oriented protocols

(IBM 2780 / 3780) and TTY

PC 1000 - SOFTWARE RELEASES

Release 1.0 (RAM BASED)   January 82

. Operating System (P.COS)
. File System & Utilities
. Command Language
. BASIC with the following extensions:

                        - Graphics
                        - Windows
                        - IEEE 488

. Printers:
              - PR 2400
              - PR 1450

. Scientific and Business Version (still under evaluation
  this availability)

. ISAM Routines (in BASIC) for internal use only

PC 1000 - SOFTWARE RELEASES

April 82

Release 1.1

- Bysync. Communication (2780/3780/3741)
- Async. Communication (TTY like Terminal)
- RS 232 Logic Management (Assem)
- ISAM Routines for Customers ("
- Assembler Lang.
- Sort
- OliCalc
- Screen Editor
- 80 x 24 (char. x line) Display Capacity
- Data Star (availability still under evaluation)
  (Data entry).

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PC 1000 - SOFTWARE RELEASES

Release 1.2   June 82

.4 Colors Version

Release 2.0   August 82

.HDU Based Version

Release 3.0   January 83

.PASCAL

.VIDEOTEX

Release 1.0 in ROM   Sept. 82

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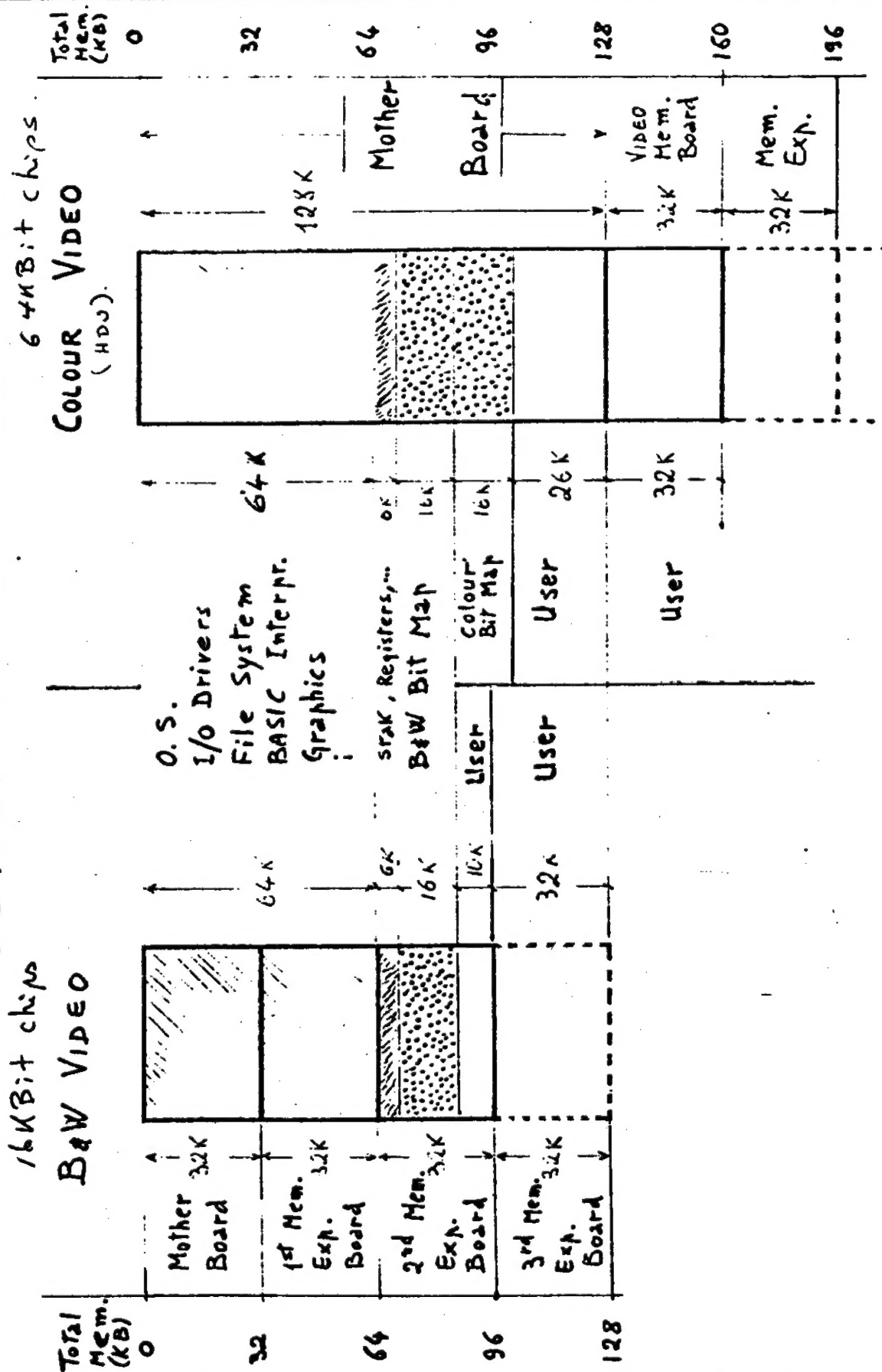
PC 1000 — FUTURE HARDWARE EXTENSIONS SUMMARY

- RS232 / Current Loop Optional Board (under evaluation)   Apr. 82
- KATAKANA Version   Apr. 82
- Integrated HDU Configuration   Aug. 82
- Colour Video   Jun. 82
- ROM Model —   Sept. 82
- External, Self-powered HDU Box (tentative schedule)   Jan. 83
- VIDEOTEX   Jan. 83

upgrade to harddisk (for ns with tk m) d version)

PC 1000 : RAM Based . MEMORY REQUIREMENT

Colour Video (HDJ) — 64 KBit chips

Total Mem. (KB):
0
32
64
96
128
160
196

128K — Mother Board

32K — Video Mem. Board

32K — Mem. Exp.

64K, 0F, 16K, 16K — 26K — 32K

O.S.
I/O Drivers
File System
BASIC Interpr.
Graphics
SRAM, Registers,...
B&W Bit Map
Colour Bit Map
User
User

B&W Video — 16 KBit chips

Mother Board 32K
1st Mem. Exp. Board 32K
2nd Mem. Exp. Board 32K
3rd Mem. Exp. Board 32K

64K, 6K, 16K, 16K — 32K

User
User

Total Mem. (KB):
0
32
64
96
128

PC 1000 . COMMERCIAL MANUALS

- System Summary
- Operation and PCOS Reference Manual
- BASIC Programming Reference Manual
- General Service Manual
- Reference Guide
- Release Guide
- IEEE 488 Reference Manual

- Communications Reference Manual
- Assembly Language Ref. Manual
- Application Packages   "   "
        - ISAM
        - SORT
        - DATA STAR
        ⋮
- VIDEOTEX   Reference Manual
- PASCAL   "   "

DIAGNOSTICS

PC 1000 HAS 3 DIAGNOSTIC LEVELS:

- POWER-ON DIAGNOSTICS

  RESIDENT IN FIRMWARE ON ALL PC 1000 MODELS

- USER DIAGNOSTICS

  RESIDENT DISKETTE, SHALL FORM PART OF THE UTILITY PROGRAM
  LIBRARY TO BE SOLD TO USER

  SHALL HELP THE USER DISTINGUISH BETWEEN HARDWARE AND SOFT-
  WARE FAULTS

- SERVICE DIAGNOSTICS

  RESIDENT ON DISKETTE INTENDED FOR THE FIELD SERVICE TECHNICIAN
  SO AS TO BE ABLE TO DIAGNOSE FAULTY MODULES